

# Proposal for a new series of amendments to UN Regulation No. 13 (Heavy Vehicle Braking)

Submitted by the expert from France\*

## I. Proposal

*Amend §5.2.1.35.11.2. to read:*

It shall be demonstrated that the energy management system accurately identifies the condition at which the warning signals required by this Regulation are activated.

The Technical Service shall take account of the influence of the individual variables used by the energy management system, on both the performance and the state of the electrical storage device(s), to assess if the accuracy of the energy management system is ensured under all operating conditions that can reasonably be foreseen (e.g., changes in temperature).

The Technical Service shall review the documentation provided by the manufacturer and conduct relevant verification testing. **The verification testing shall be performed by the Technical Service itself or in collaboration with the vehicle manufacturer.**

*Insert a new section to read:*

**In the context of the assessment described in §5.2.1.35.11.2., the manufacturer shall include in the documentation shared with the Technical Service, when available, the following information:**

- 1. Regarding the Energy Management System;**
  - 1.1. A detailed overview of the energy management system, explaining its architecture, components, and capacities,**
  - 1.2. A description of how the system monitors and manages electrical storage devices.**
  - 1.3. A clear outline of how the energy management system operates to ensure sufficient energy for the electro-mechanical braking system.**
  - 1.4. Sufficient information to illustrate the algorithms and logic used to assess the state of electrical storage devices.**
  - 1.5. A list of all the input variables considered by the energy management system in assessing the state of the electrical storage devices.**
  - 1.6. Include a sensitivity analysis that demonstrates how changes in each variable affect the energy management system decision-making process.**
- 2. Regarding the relevant verification testing:**
  - 2.1. The documentation shall include a clear thresholds or criteria that trigger the warning signals described in §5.2.1.29.1.1. and §5.2.1.29.1.2.**
  - 2.2. Results of verification testing conducted by the manufacturer to assess the accuracy of the energy management system. These reports shall highlight the key findings, observations, and any deviations from expected outcomes.**

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\* In accordance with the programme of work of the Inland Transport Committee for 2024 as outlined in proposed programme budget for 2024 (A/78/6 (part V sect. 20) para 20.5), the World Forum will develop, harmonize and update UN Regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.

- 2.3. The documentation shall include data on different operating conditions, such as temperature variations or battery ageing.
- 2.4. The documentation shall outline potential specific conditions that could impact the accuracy of the energy management system.
- 2.5. The documentation shall describe mitigation strategies implemented to address failures and ensure the energy management system reliability to the best of its ability.
- 2.6. When applicable, the documentation shall include the procedures for updating the energy management system and ensuring its ongoing maintenance.
- 2.7. The documentation shall provide the appropriate testing procedures to be taken into account when performing the relevant verification testing to ensure compliance with §5.2.1.35.9. and §5.2.1.35.10.

The information provided, if applicable, shall be supplied in triplicate and include a list of contents. Any drawings shall be supplied in appropriate scale and in sufficient detail on size A4 or on a folder of A4 format. Photographs, if any, shall show sufficient detail.

## **II. Justification**

Providing this information should permit to ensure that the electronic management system not only operates effectively under various conditions but also that its behaviour is well-understood and thoroughly tested.

This information should permit the Technical Service to set up a controlled environment to simulate different operating conditions and ensure that the vehicle is equipped with the necessary instrumentation to perform the relevant verification testing; the Technical Service should be able to evaluate the influence of individual variables on system performance and the state of electrical storage devices.

By specifying what information is expected from the manufacturer, it should facilitate the cross-check of the documentation with actual testing results to ensure consistency and compliance with the appropriate requirements.